

DERWENT-ACC-NO: 2001-033658  
DERWENT-WEEK: 200105  
COPYRIGHT 1999 DERWENT INFORMATION LTD

TITLE: Plastic component with e.g. GRP-bonded metal inlay, varies composition, density and orientation of fibers for optimal stress transmission, strength and durability, overcoming differential thermal expansion and resilience mismatch

INVENTOR: FAISST, D; NIEDERMEIER, M ; REIF, G

PATENT-ASSIGNEE: ALUSUISSE TECHNOLOGY & MANAGEMENT AG[SWAL]

PRIORITY-DATA: 1999CH-0000610 (March 31, 1999)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
EP 1048442 A1	November 2, 2000	G	021	B29C 070/72
CA 2302964 A1	September 30, 2000	E	000	E04C 005/07

DESIGNATED-STATES: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU  
LV MC MK N  
L PT RO SE SI

APPLICATION-DATA:

PUB-NO	APPL-DESCRIPTOR	APPL-NO	APPL-DATE
EP 1048442A1	N/A	2000EP-0810218	March 15, 2000
CA 2302964A1	N/A	2000CA-2302964	March 29, 2000

INT-CL\_(IPC): B29C037/00; B29C045/14 ; B29C070/68 ; B29C070/72 ;  
E04B001/38 ; E04C005/07

ABSTRACTED-PUB-NO: EP 1048442A

BASIC-ABSTRACT: NOVELTY - Plastic component with e.g. GRP-bonded metal inlay,  
varies composition, density and orientation of fibers.

DETAILED DESCRIPTION - Any combination of the following structures may be included. The inlay (13) is bonded to the plastic body (11) by a plastic layer (12), in which state the bonding layer smoothly transforms the modulus of elasticity determining stiffness, and/or the coefficient of thermal expansion,

between body and inlay. The bonding section may contain one or more holes through which reinforcing fibers, fibrous strands and/or textile sheet are looped. These are embedded in the plastic matrix of the component, to which they are intimately bonded. The bonding section has comb-shaped, parallel or fanned-out strips; or else molded-on fingers.

An INDEPENDENT CLAIM covers the method and variant methods of making corresponding component forms. In one version, the inlay is metal which is first surface-treated for adhesion. A coupling layer of fiber-reinforced plastic is added. The result is placed in a pressing- or injection mold with the plastic body. The plastic body is deformed in an injection- or pressing process, resulting in an interlocking bond.

USE - To make a composite component, in which an inlay is bonded, preferably using fiber-reinforced plastic, where the fibers, their composition, proportions and orientations are selected and controlled for optimum stress transfer between the body of component and inlay. Interfacial bonding and keying are also optimized. Applications include: trams and other rail vehicles, aircraft, machines and building structures (all foregoing applications are claimed).

ADVANTAGE - The component is produced economically with a bonding which has high mechanical strength, load bearing capability and lasting adhesion, despite differing elasticity, stiffness and coefficients of thermal expansion between body and inlay, noting that the inlay is a metal, especially aluminum. Large numbers of possible materials are specified in the disclosure, hence the principles may be considered widely-applicable. The process and examples are further discussed and illustrated by cross sections in the disclosure.

DESCRIPTION OF DRAWING(S) - The cross section is one of a number of possible variants illustrated in the disclosure.

plastic body 11

reinforced plastic layer 12

inlay 13

CHOSEN-DRAWING: Dwg.4/11

TITLE-TERMS:

PLASTIC COMPONENT GRP BOND METAL INLAY VARY COMPOSITION  
DENSITY ORIENT OPTIMUM

STRESS TRANSMISSION STRENGTH DURABLE OVERCOME DIFFERENTIAL  
THERMAL EXPAND  
RESILIENT MISMATCH

DERWENT-CLASS: A32 A95 Q43 Q44

CPI-CODES: A12-H00H; A12-R01; A12-S08B; A12-S08D1; A12-S08D3; A12-T04D;

ENHANCED-POLYMER-INDEXING:

Polymer Index [1.1]

018 ; P0464\*R D01 D22 D42 F47 ; K9892 ; S9999 S1434

Polymer Index [1.2]

018 ; ND04 ; N9999 N6042\*R ; N9999 N6235 ; N9999 N6462 N6440 ; N9999  
N6484\*R N6440 ; N9999 N6542 N6440 ; Q9999 Q9234 Q9212 ; Q9999 Q9289  
Q9212 ; Q9999 Q9303 Q9212 ; Q9999 Q9223 Q9212 ; Q9999 Q6826\*R ;  
B9999 B3838\*R B3747 ; B9999 B5301 B5298 B5276 ; N9999 N6519 N6508  
N6484 N6440 ; B9999 B4091\*R B3838 B3747 ; B9999 B3930\*R B3838 B3747  
; B9999 B5538 B5505

Polymer Index [1.3]

018 ; G2891 D00 Si 4A ; R05086 D00 D09 C\* 4A ; A999 A419 ; A999  
A771 ; S9999 S1070\*R

Polymer Index [2.1]

018 ; A999 A782 ; A999 A419 ; P0737\*R P0635 H0293 F70 D01 D18 ;  
S9999 S1092 S1070

SECONDARY-ACC-NO:

CPI Secondary Accession Numbers: C2001-010352